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**UNITIZING THE ROYALTY INTERESTS**

BY

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# Unitizing The Royalty Interests

*A Suggestion by Frederick Squires\**

Many efforts to improve production practices by better utilization of reservoir energy collide with the stone wall of multiple royalty ownership.

In many cases where it is possible to unite the oil producers because they are relatively few, well informed, and influenced by intelligent self interest, the royalty owners cannot be brought together because of their numbers. There are usually many land interests over a pool, and the royalty trader's practice of buying part or all of the farmer's royalty, and then often subdividing this by sale to a much greater number, results in such a multiplication and scattering of holdings that there is no possibility of uniting them. It is to suggest a means to remove this difficulty and to confine the unification of a pool to the operators alone that this paper is directed.

## **Inequalities in Returns Under Separate Lease Operations**

Separate royalties do not always, or even often insure to a land owner his royalty in the same amount of oil which underlay his farm when he leased it. Figure 1 demonstrates that the effect of a natural water drive may be to enrich succeeding farms with oil driven to them from other farms nearer the source of encroaching water. Even if the contributing landowner knew that this was happening he could not compel the operator to stop it. Contributions of part of the oil which underlay his land to the owners of other tracts are obviously possible and often provable in normal production from individual leases. The action of natural underground forces, such as edgewater invasion or gas-cap expansion, change the distribution of oil and gas under the farms as production proceeds, and since the operator is not responsible for such natural changes there is no way for the royalty owner to hold him accountable. If, however, the same result is accomplished by artificial agencies, such as unequal well spacing or the injection of water at the edge or gas into the cap, or both, or unequal varying of production from wells, the owner of a royalty interest, if it is being depleted, may block the operation on the ground that it is demonstrable that he is being unfairly deprived of part of his royalty interest in oil which underlay his holdings. But since such engineering processes are productive of more oil for the royalty owners as a whole, even though some lose and others gain, their use should be so arranged as to be acceptable to the farmer. The unitization of the royalty interests in the lease before production begins, forming a new kind of farmers' cooperative, is the way to do it.

## **Oil Pool Areas Vs. Land Divisions**

When Thomas Jefferson divided part of our country into rectangular townships and sections which settled future land ownership he had no idea how much trouble and loss he was going to cause oil operators and royalty owners. The same difficulty would have resulted from any other uniform system

of land division. States like Texas and Kentucky, which were laid out without Jefferson's help, also made plenty of trouble as did the old French surveys forming long ribbon farms with narrow footage along winding rivers. Yet surface divisions having determined the shape of the parcels into which ownership must fit, determined also the shape of leases, regardless of the disparity between them and the form of the oil pool below.

It is obvious that there can be little similarity between surface ownership divisions and the area of oil pools lying beneath them; yet the law of capture which gives an operator the right to own all the oil and gas from a piece of land that he can bring to the surface of that land, was an attempt to fit the round peg into the square hole and has complicated for many years and still complicates the production of oil. It is now realized that the attempt to capture on each particular farm all the elusive oil and gas beneath it is not the way to get the greatest return for either the operator or the farmer. It is generally agreed that, for best results, the farms over one pool should be pooled into one farm.

## **Loss of Production Due to Disunity of Leases**

Disunity or separate operation of leases is detrimental to oil production because it requires strict observance of property lines. Individual ownership of royalties hinders efficient production by dissipating reservoir energy and obstructing its restoration. (See Figure 2.) It is particularly detrimental:

- a. When maintenance of reservoir pressure requires that edgewater wells be abandoned as producers and used for injection of water under pressure.
- b. When the best interests of the pool require an expansion of the gascap by means of abandoning high gas-oil ratio wells on the perimeter of the existing gas-cap and using them for gas injection wells.
- c. When the best interests of the pool requires injection of water and gas conjointly to increase the gas-cap and contract the contacting edgewater by abandoning edge gas- and oil-producing wells and converting them into injection wells.
- d. When the pool is producing under natural edgewater encroachment or natural gas-cap expansion requiring that intermediate wells be abandoned as producers and converted to input wells.
- e. When the pool is to be developed by secondary recovery through pattern flooding or pattern gas injection, because:

For best results flooding patterns must be determined by conditions of permeability, porosity, oil content, depth to producing stratum, etc., existing in the particular reservoir, no one of which conditions need bear any relation to surface ownership divisions, and almost never does.

For best results proper locations of gas injection wells and their optimum distances from pumping wells

\* Petroleum Engineer; Illinois State Geological Survey.

must also depend on porosity, permeability, etc., and are also entirely divorced from surface ownership division. With changes in lateral permeability of the sand in a single pool, changes in well spacing either for water or gas are required, and adherence to property lines restricts and often prohibits such desirable elasticity of layout (Fig. 3).

- f. When for best results whole farms should be abandoned as producing territory and used for input territory, or left quiescent as in expanding gas-cap or advancing edgewater zones.

#### Benefits From Unitization

When unitization of royalty interests is obtained, the producer and the farmer become cooperative partners and the farmer benefits by the opportunity he has given the producer to use scientific techniques. The advantages gained by such cooperation are as follows:

1. Freedom in spacing wells according to geological and engineering investigation rather than property line restrictions.
2. Improvement in average gas-oil ratios, and water-oil ratios, by shutting in wells before such ratios become wasteful.
3. Freedom to add to a gas-cap and water to edgewater or both, even when to do so involves abandonment as producers of wells in border areas.
4. Freedom in selection of patterns and spacing in secondary recovery and opportunity to vary the pattern in a single pool to fit variations of its permeability, etc.
5. Proper operation of distillate properties.

#### Unitization Would Have Helped Illinois Pools

One of the best examples of loss through disunity is the Devonian production in the Centralia pool. This oil was under strong water drive and some gas expansion, and it is probable that had the Devonian pool been unitized the wells would have flowed during their entire productive life. Instead, wells are now pumping vast quantities of water at high cost to obtain small oil production, and the total is unquestionably much less than could have been obtained by controlled output of flowing wells.

The Dix pool would be greatly benefitted if it could be flooded by returning water to its low structure circumference in the amount of the fluid taken out of its high structure interior, an operation possible only under unit operation.

The central basin McClosky areas, held largely by one company and susceptible to improvement by flooding, would be more successfully operated under unitization. This is also true of many other Illinois pools which are showing edgewater encroachment, such as Woodlawn and Benton.

#### The Evolution of Unitization

Long ago Henry L. Doherty advocated the principle of unitization and the movement has been going on since then in many different ways. Its earliest manifestation was aimed at operating economy. Producers began to block up holdings by purchase or trade to form larger and therefore more economically operable properties. This gave them a chance to centralize machinery and manpower. Power on one farm which pumps wells on it and other farms, the collection of gas from all wells in a pool to be treated at a central gasoline plant, secondary recovery compressor plants collecting from and returning gas to a number of leases marked this tendency. Community salt water disposal, gas storage, community control of bottom-hole pressures and gas-oil ratios, casing-head back pressures and community gas sampling, and spacing patterns settled by state regulatory bodies, are further developments tending toward complete unitization. This centralization is beneficial to both the operator and the farmer. Also new conceptions of reservoir behavior put emphasis on the retention of its energy which demonstrated the necessity of unitization.

There has also been an evolution of the concept of the Nation's interest in oil resources and oil recovery, especially

during the present World War. A war of the magnitude and character of the present conflict brings home the fact that the country's resources, although privately owned in the main, are or may become necessary to the perpetuation of the American way of life. Therefore from that standpoint also the necessity of making as complete recovery as possible of our oil resources is obvious.

#### The Time to Unify

The most propitious time to get land owners together is before production has been found, and the best vehicle to use is the lease. Because the land owner has much to win and nothing to lose, he is willing to lease, as is evidenced by the general success of the oil companies in obtaining large, almost unbroken blocks of territory.

#### The Royalty Unitization Clause in the Lease

Modern leasing moves fast. After an oil company has formed a favorable opinion of the value of an area, it plans a whirlwind campaign and leases farms so rapidly that the great majority are tied up before competitors know what is going on. This has been true in many areas in Illinois, notably at Loudon, Salem, Patoka, and the Central Basin McClosky area.

It is the belief of the writer that a unitization clause should be incorporated in every lease. In the areas mentioned,

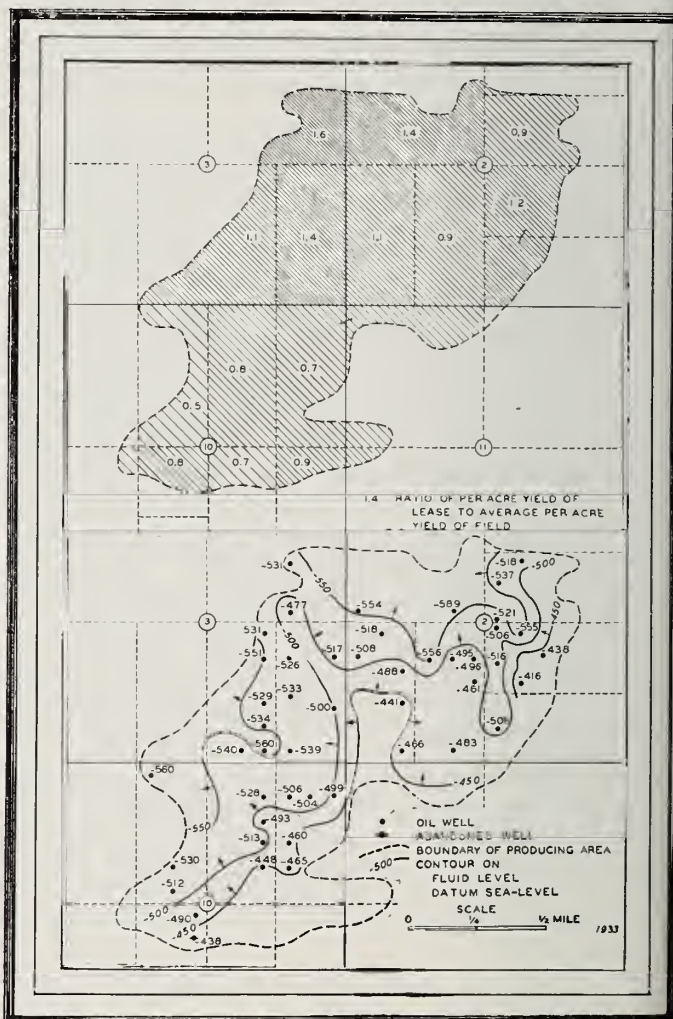


FIGURE 1

This shows the direction and extent of the movement of water in an edgewater encroachment on an Illinois oil pool and demonstrates, by the increased production of farms in the direction of the water movement, the fact that oil from one farm is moved to the next farm and part of it recovered there although it did not originally underlie the point of recovery. The illustration is used to prove the claim that the old law of capture presents unfairness to the royalty owner.



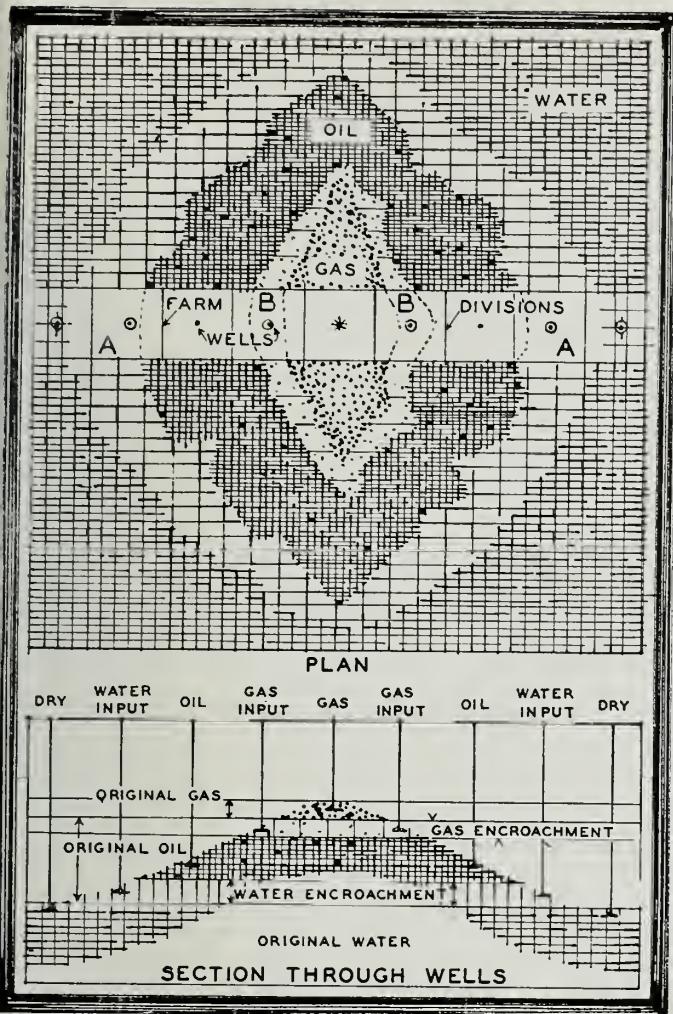


FIGURE 2

This is a plan and section through an oil pool and is presented to illustrate the advantage of unitization. The pool is under gas-cap expansion and edgewater encroachment. When the wells on Farms A and B begin to show, respectively, wasteful ratios of water and gas to oil they may be shut down as producers and changed into input wells. Although these farms no longer produce oil, they become instruments for the production of a greater quantity of oil from the pool as a whole. Under disunity, wells on these farms would be produced under wasteful water-oil and gas-oil ratios and when no longer able to produce oil in paying quantities, would be abandoned, which would entail the abandonment of the lease, making it impossible to use the territory for input purposes.

leased under such conditions, fairly workable unitized pools under one company ownership would have resulted. Had all the leases in the same pool used a unitizing clause in their leases, the principal obstacle to unity would have been eliminated. Since the producing company, even after its preliminary investigation, does not know which, if any, of the leases will be productive, whether or not several are destined to produce, or the order of their value, it is obvious that the individual farmer has no reason to be sure of production on his own land.

Therefore the essence of the following clause\* should appear in every lease, as an alternative to the usual royalty agreement wherever state statute's permit:

"Notwithstanding anything in this lease contained to the contrary, where unit operation of any area, including the leased premises, or any part thereof, is necessary to comply with governmental order or action, or when the leased premises or any part thereof could be more economically devel-

oped and operated through unit operation, the lessor agrees that any part or all of the leased premises may be so unitized or pooled, and in such event the lessor's royalty shall be based on the per cent of total production from the unitized area that his acreage included therein bears to the total acreage of the unitized area, and drilling operations or production on any part of such unitized or pooled area, whether or not on acreage covered by this lease, shall be considered as drilling operations or production on the leased premises."

It is obvious that such a clause would be beneficial to the producing company if the other operators unitized, in that it would require the drilling of fewer wells, both for primary and secondary operations, would permit the use of natural reservoir forces as well as the introduction of gas into a gas-cap, or water into the edge area, or both, and after the area of production was outlined would allow the drilling and producing of such wells only as would most efficiently withdraw the oil, and would allow the abandonment as producers of all wells detracting from pool efficiency without losing the right to convert such wells when alone on leases into pressure restoring inputs.

The royalty owners as a class would benefit because unit operations produce more oil. It is possible that the increased production due to unitization, would return a royalty partner in the operation more oil than he would have obtained under

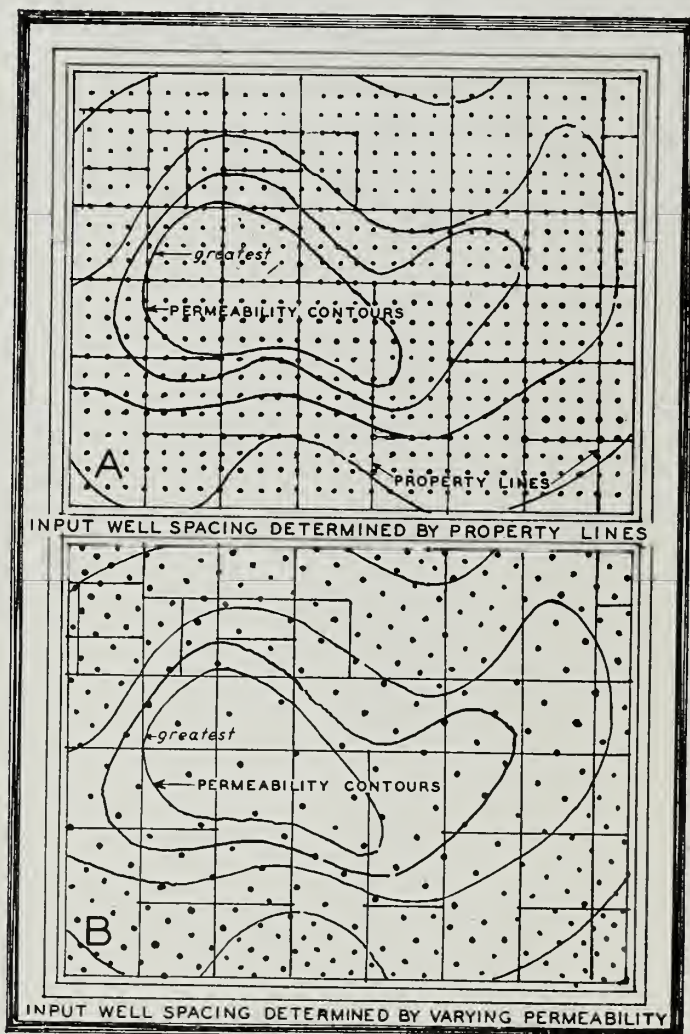


FIGURE 3

This shows diagrammatically by comparison of maps A and B the difference in the amount of drilling and consequent expense when secondary recovery plans are laid out (A) using property lines as the determining factor under disunity and (B) using spacing determined by permeability under unitization.

\* Quoted from a lease actually in use in the State of Florida.

separate development, even were his farm over the richest part of the pool.

### One Big Farm

The underlying idea in unitization is to develop and operate a pool as though it underlay one big farm instead of many little ones. Let us assume that there is a ranch of twenty-five hundred acres owned by 25 partners. The partners have agreed that they may lease the ranch as a whole or divide it into twenty-five separate equal tracts, assigned by lot, one to each partner who may execute a separate lease on his own tract. There is no doubt that an operator would want a single lease on the entire property. How should the twenty-five partners look at it? There should be no doubt about the choice of the landowners. The total amount of oil recovered would be far greater from one lease than from twenty-five, because

reservoir energy would be used more efficiently and the cost of operating would be decreased so that the economic limit would be lower. They should choose the single lease because by doing so each would be sure to get some return, if oil was found anywhere on the twenty-five hundred acres. Nobody would be entirely left out as would be apt to be the case were the property divided into 25 separate leases.

A moral consideration should guide their decision. Nature has made them co-owners of pool energy which cannot be equitably divided between separate owners but can readily be controlled as a unit to the equal and mutual advantage of members of the partnership and in the national interest.

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